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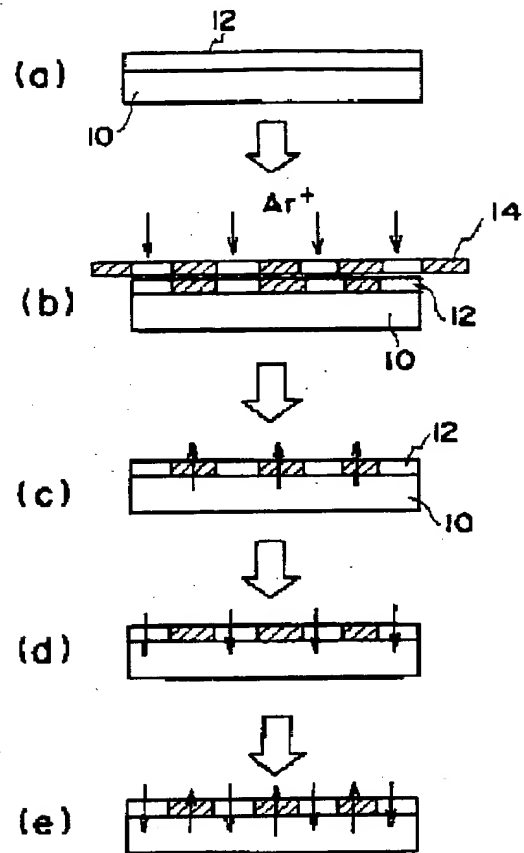
APPLICATION DATE : 27-01-99
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APPLICANT : TOYOTA MOTOR CORP;

INVENTOR : NAKAYAMA HIDEKI;

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TITLE : PRODUCTION OF NONLINEAR
OPTICAL SILICA THIN FILM



ABSTRACT : PROBLEM TO BE SOLVED: To provide a process for producing a nonlinear optical silica thin film capable of forming fine polarization inversion structures with a simple stage.

SOLUTION: The SiO₂-GeO₂-base glass thin film 12 formed on a substrate 10 is subjected to irradiation with ion beams of argon ions, etc., only at the specified portions where the glass transition temperature is made lower than that of the non-irradiated portions by cutting between silica networks. Next, the substrate is subjected to alignment processing of dipoles at above the high- temperature side glass transition temperature of the non-irradiated portions and is then subjected to alignment processing of a reverse direction at a temperature above the low-temperature side glass transition temperature of the irradiated portions and below the high-temperature side glass transition temperature. As a result, the polarization inversion structures varying in the alignment directions of dipoles in the irradiated portions and non-irradiated portions with the ion beams may be formed.

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